REMARKS/ARGUMENTS

The subject matter of Claim 3 is combined into Claim 1 (Currently amended). Thus Claim 1 (Currently amended) is original Claim 3 amended to be independent.

Claims 3 and 4 are deleted.

Claim 1 is rejected under 35 U.S.C. 102(b) as anticipated by Fu et al. This is rendered moot by the amendment of Claim 1 to include Claim 3 subject matter. Also, it is noted that a reference as defined by 102(b) must have a publication date more than one year before the effective filing date in the United States. The effective filing date of this application is the international filing date. Assuming Fu et al was published on August 9, 2005, this is less than one year before September 1, 2005 international filing date. Therefore, Fu et al is not a proper reference under 35 U.S.C. 102(b) and, therefore, there is no preclusion to rely on an earlier priority date to avoid this reference (see below).

Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fu et al in view of Yamamoto et al. As noted above, the invention date of the present invention is earlier than publication date of Fu et al. In order to perfect the priority date of the present claims, there is submitted herewith a translation of the priority application. This predates Fu et al. Furthermore this rejection is not applied to Claim 3 which is the current main claim presented as Claim 1 (Currently amended)to include the subject matter of Claim 3. Thus it is moot.

Claims 1-3, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walt et al in view of Yamamoto et al.

The invention as now claimed is Claim 1 (originally in Claim 3) is:

a hollow microparticle comprising a hollow portion and a high-density polymer brush layer enclosing the hollow portion,

wherein the polymer chain composing the polymer brush layer is a block copolymer of at least one crosslinkable monomer having a crosslinkable functional group and a non-crosslinkable monomer,

blocks of the crosslinkable monomer are located innermost of the polymer brush layer, and

crosslinkable monomer blocks in a polymer chain and the crosslinkable monomer blocks in a discrete polymer chain are crosslinked via a linkage formed by reaction between the crosslinkable functional groups or via a linkage formed by reaction between the crosslinkable functional groups and a polyfunctional compound.

As explained in the first several pages of the specification, an object of the invention is to provide microparticles with controlled properties required characteristic (e.g. see page 3, lines 8-13). An unfortunate technical feature of the present invention as reflected in Claim 1 is the location of two kinds of monomer blocks (crosslinkable monomer blocks and non-crosslinkable monomer blocks).

The polymer brush layer of the present invention is a block copolymer of at least a crosslinkable monomer and a non-crosslinkable monomer. Blocks of the crosslinkable monomer are located innermost of the polymer brush layer, and the crosslinkable monomers are crosslinked. The linkages of the

crosslinkable monomers are located innermost of the polymer brush layer, and non-crosslinkable monomer blocks are located outside of the crosslinkable monomer blocks of the polymer brush layer.

The advantages of this structure includes that, because the innermost of the polymer brush layer is crosslinked, the hollow polymer brush of the present invention does not disintegrate even if it is dissolved in an organic solvent or an aqueous solvent. Further, because the polymer chains were fixed on each other at the innermost, the outside of the polymer brush layer maintains the original property of the polymer brushes, such as extension of polymer chains. Thus, a hollow polymer brush of present invention can maintain the original property of the polymer brushes as a microparticle.

Another advantage of the claimed invention is that the hardness of the innermost of the hollow polymer brush can be controlled by changing the degree of crosslinking. A higher crosslinking degree affords a harder core, and a lower crosslinking degree affords a softer core.

Walt et al discloses core-shell microsphere compositions, hollow polymeric microspheres. Walt et al. also discloses that

the hollow polymer microspheres were prepared by coating silica microsphere templates with poly(benzyl meth acrylate) using surface initiated controlled/living radical polymerization (see [0039]). The strength and the durability of the polymeric shell are increased by crosslinking polymer chains (see [0011]).

Yamamoto et al discloses polymer brushes comprised of low-polydispersity poly(methyl methacrylate)(PMMA) chains densely end grafted on a silicon substrate by living radical polymerization, these brushes are characterized by an exceptionally high nearly constant graft density approximately 0.4 chains/nm^2 and wide range of molecular weight of the graft chains.

According to the Examiner, the present invention (original Claim 3) would have been obvious to one of ordinary skill in the art at the time of invention by a combination of Walt and Yamamato. However, a combination of Walt et al and Yamamoto et al would not arrive at the present invention as detailed above and summarized below.

Walt et al does not disclose a polymer brush, so it does not disclose the polymer chain's structure of polymer brush layer. Yamamoto et al discloses polymer brushes whose polymer chains are

composed only of homo monomer. These polymer chains are not even block copolymers. Polymer chains of the present invention are block copolymer, wherein blocks of the crosslinkable monomer are located innermost of the polymer brush layer, and the crosslinkable monomers are crosslinked.

In contrast, neither Walt et al nor Yamamoto et al discloses the structure of block polymer of the present invention, as required in the present invention.

The other claims depend directly or indirectly from Claim 1 and are allowable therewith.

In view of the above, the present invention is not shown or suggested by the cited art. Therefore, withdrawal of the rejections and allowance of the application are respectfully requested.

Respectfully submitted,

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